that in this country too our butterflies are up later and to bed earlier than our birds. Dr. Longstaff and Mr. Annandale have made statements supporting this.

*(To be continued.)*

## Myrmecophilous Notes for 1912.

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

### FORMICIDÆ.

#### Subfamily Ponerinæ.

*Ponera coarctata*, Latr.—On May 30th a number of ☿ ☿ were found in a nest of *Formica fusca* at Box Hill. Six of them were introduced into a *fusca* observation nest from Tiree, where they lived for a few months, till they eventually died. They were never attacked by the *fusca* ☿ ☿, although they moved about freely in the nest. When a *fusca* ☿ met a *Ponera*, she simply tapped it with her antennæ. In July ☿ ☿ were found under stones on the edge of the Deal sandhills.

On September 5th I went to Box Hill to try and find ♂ ♂, of which I did not possess any specimens. Searching in moss and under stones, where the species usually occurs there, being unsuccessful, I started to sweep the herbage round about. There success rewarded my efforts and I captured a ♂ in the first sweep. After this specimens were swept up for about an hour, when they ceased to appear. Only one ♀ occurred and she had lost the wings on one side, evidently having been fertilized. When placed in a tube with a ♂, the latter endeavoured to embrace her without success. As far as I am aware the ♂ of *P. coarctata* has not been taken in Britain by anyone else now living.

The ♂ of *P. punctatissima* has not yet been found here. I have looked for it carefully in the British ant collections at Oxford and the British Museum, etc., as being apterous and very ergatoid it might well have been mistaken for a ☿. Emery[1] gives a good figure of it in a paper on ergatoid males.

#### Subfamily Myrmicinæ.

*Myrmecina graminicola*, Latr.—On Sept. 5th I found a small incipient colony of this interesting little species at Box Hill, in a nest of *Myrmica scabrinodis*, under a stone. It consisted of a deälated ♀ and 8 ☿ ☿, which were situated in a small chamber in the middle of the *Myrmica* nest. On the same day I swept a large number of *M. graminicola* ♂ ♂ in company with the *P. coarctata* ♂ ♂ recorded above, but no winged ♀ ♀ occurred. I may mention that many *Proctotrupidae* were also swept, some with dark wings like the *Myrmecina* and some with clear wings like the *Ponera*, which, respectively, much resembled both species. On September 7th I found a ☿ of *M. graminicola* in a nest of *Lasius flavus* at Sandown, Isle of Wight. I[2] have before recorded many instances when this ant has occurred with other species. It seems probable that the ♀ of this species may often seek the protection of another ant's nest to found her colony.

[1] *Festsch*, f., J. Rosenthal, Leipzig, 1906, p. 37.
[2] *Ent. Rec.*, 1909, p. 258, 1912, p. 4, etc.,

Wheeler[3] records the American sub-species of this ant as also being found in other ants' nests.

*Formicoxenus nitidulus*, Nyl.—On May 17th I found a deälated ♀ and one ☿ in a nest of *Formica rufa* at Nethy Bridge; this is its first record for Scotland. It is evidently rare there, as I spent five days in digging up and sifting *rufa* nests thoroughly, all over the district, and these were the only specimens I found.

Fired by my success with *Ponera* ♂ ♂ at Box Hill, on September 6th I went to Weybridge to try and find ♂ ♂ of this species, which I had also never captured before. As soon as I got to a *rufa* nest in which I have always found deälated ♀ ♀ and ☿ ☿ of *F. nitidulus*, I observed a ♂ running on the top of the nest. The day was cloudy and dull, just such a day as Wheeler[4] describes, when he found ♂ ♂ in the Upper Engadine.

Further work at the nest produced more ♂ ♂, but no winged ♀ ♀ were found (I have only once taken the winged ♀, at Bournemouth in 1906), but deälated ♀ ♀ and ☿ ☿ were numerous. When some of these ♀ ♀ were enclosed in tubes with ♂ ♂, the latter immediately climbed on their backs, grasping them round the thorax with their short mandibles. Some of the ♂ ♂ endeavoured also to get *in copula* with the ☿ ☿, as is also recorded by Wheeler. The ♂ is easily recognised by its longer antennæ, which are somewhat bent when alive, and by its more active and restless habits.

*Anergates atratulus*, Schenck.—On July 23rd Crawley and I found an *Anergates-Tetramorium* colony in the New Forest. Three ♂ ♂, a large number of winged ♀ ♀, one obese ♀, and a number of larvæ of the *Anergates* were taken. We have dealt at length with this important discovery in our paper read at the Congress at Oxford, and elsewhere.

*Myrmica scabrinodis*, var. *sabuleti*, Meinert.—Full details of this variety, will be found in my paper[5] on the genus *Myrmica*. I took ☿ ☿ at Box Hill, on May 5th, and ♂ ♂, ♀ ♀ and ☿ ☿ in nests in the same locality in September, and in the New Forest in July, and at Seaton in Devon with Crawley in August. Hamm has sent me ☿ ☿ which he took at Shotover in 1903, which were named *lobicornis* for him by Saunders (a determination with which he, Hamm, could never agree), and again in 1905. I have also seen ☿ ☿ sent to me to name by Bedwell, the locality of which I do not know.

*Myrmica ruginodis*, Nyl.—Colonies of this species were found on the Isle of Mull and in plenty on the Isle of Tiree in April.

*Leptothorax acervorum*, F.—G. A. Brown showed me a colony of this ant in a stump at Coatbridge, N.B., in April. (Records of common species like this and the one preceeding, are only given to extend our knowledge of their distribution in Britain). At Nethy Bridge, on May 19th, a solitary deälated ♀ was found under a stone.

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[3] *The Amer. Nat.*, xxxv., 1901, p. 519.
[4] *Jour. f. Pyschol. u. Neurol.*, xiii., 1908, p. 430.
[5] *Ent. Rec.*, 1913, p. 43, etc.

Various colonies were observed there, as usual, under bark and stones, and the ♀ ♀ (a fact which I have often noticed before, and which is recorded by Forel[6]), as well as the ☿ ☿ carry the larvæ and pupæ, and remove them into safety, but Hamm tells me he has seen the ♂ also carry the larvæ! In July a colony consisting of ♂ ♂, ♀ ♀ and ☿ ☿, was found under a stone on a *rufa* nest in the New Forest. Instances[7] of this ant in other ants' nests have often been recorded before. On September 14th a small colony was found at Weybridge inhabiting a fallen oak-apple. It consisted of a single deälated ♀, 73 ☿ ☿, and a number of larvæ.

*Leptothorax tuberum* var. *tubero-affinis*, Forel[8].—Crawley and I found a number of colonies of this variety in the New Forest in July. They were situated under stones, often in connection with *Tetramorium* nests, and contained ♂ ♂, winged and deälated ♀ ♀, ☿ ☿ and brood, and in one or two a single deälated ♀ and ☿ ☿.

## Subfamily Dolichoderinæ.

*Tapinoma erraticum*, Latr.—On May 12th a colony of this ant was found under a stone on a bank at Woking, which consisted of three deälated ♀ ♀, ☿ ☿, larvæ, and a large number of ♂ and ♀ pupæ, and some ☿ pupæ. I took home the whole colony and established it in a plaster nest, hoping to rear the winged sexes of which I do not possess British specimens. In spite of the fact that the ants were supplied with plenty of food, they devoured all the ♂ and ♀ pupæ. A number of the ☿ pupæ were reared and the colony is still in good condition to-day (January 26th), and eggs and young larvæ are now present. Forel[9] also records that ☿ ☿ devoured ♂ and ♀ pupæ in captivity, and only reared ☿ ☿. On July 23rd Crawley and I found a large colony of this species under a stone in the New Forest in which over twenty deälated ♀ ♀ were present.

## Subfamily Camponotinæ.

*Lasius niger*, L.—A marriage flight of this ant was noticed at Woking on September 26th.

*L. niger* var. *alieno-niger*, Forel.—Several colonies of this variety were found at Weybridge in September containing ♂ ♂, winged ♀ ♀, and ☿ ☿. Harwood sent me ☿ ☿ from Clacton-on-Sea, and ♂ ♂ and ♀ ♀ from a marriage flight observed there on October 12th. These, on examination, proved to be this variety. It is intermediate between *niger* and *alienus* in size, colour, and the pubescence on the tibiæ, etc. Forel[10] says it is nearly as common as the typical forms.

*L. niger* sub-sp. *alienus*, Först.—Colonies were found at Woking, Sandown, and Blackgang, I. of W., and at Seaton, Devon. Both

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[6] *Fourmis de la Suisse*, 1874, p. 339.
[7] *Ent. Rec.*, 1906, p. 317, 1912, p. 5, etc.
[8] *loc. cit.*, p. 86.
[9] *loc. cit.*, p. 335.
[10] *loc. cit.*, p. 47.

Allen and H. C. Champion sent me specimens from the Lizard, Cornwall.

*L. umbratus* sub-sp. *mixtus*, Nyl.—I have a few more localities for this sub-species. Harwood sent ☿ ☿ to me, among some ants to name from Colchester, Best Gardner from Bourne End, Bucks., and Hallet a deälated ♀ taken on the road in March at Cwyrt-yr-ala, in Glamorgan. In my[11] paper on *mixtus* there is an unfortunate error, which also occurs (no doubt unintentionally), in Forel.[12] In the table for the ☿ he gives as one of the distinctions between *flavus* and *umbratus* and *mixtus*—1. "Ecaille . . un peu plus large en bas qu'en haut"=*flavus*. 2. "Ecaille plus étroite au sommet qu'à la base"=*umbratus* and *mixtus*. This I translated—1. "Scale a little broader at the base than at the apex," and 2. "Scale narrower at the apex than at the base," which, of course, means the same thing. The scale is broader at the apex in *flavus*, and narrower in *umbratus* and *mixtus*. I give a rough sketch of the scale of ☿ ☿ of the three ants in question.

FLAVUS ☿ UMBRATUS ☿ MIXTUS ☿

*L. umbratus* var. *mixto-umbratus*, Forel[13].—Several colonies were found at Weybridge this year, and in September ♂ ♂ and winged ♀ ♀ were secured. This variety is intermediate between *umbratus* and *mixtus*, the hairs on the tibiæ not being nearly so pronounced as in *umbratus* proper, etc. On July 18th I dug up a *L. alienus* nest at Weybridge and found that the queen of the colony was what at the time I took to be a deälated ♀ *mixtus*. Since she has died I have found that she belongs to the var. *mixto-umbratus*. The colony, which contained many large and small cocoons, was carefully dug up and taken home where it was established in a plaster-nest. All the cocoons hatched, the large ones proving to be winged ♀ ♀ of *alienus*, and the small ones of course ☿ ☿. The *mixto-umbratus* ♀ was very active, being exceedingly rapid in her movements, and very excited when first dug up. She laid eggs on August 7th and was always treated as their queen by the *alienus* ☿ ☿, who fed and cleaned her and attended to her brood. By September 1st small larvæ had hatched, and to-day a number of larvæ are present. The ☿ ☿ killed some of their own winged ♀ ♀ on November 1st, when the *mixto-umbratus* ♀ was observed to be unwell, though carefully attended to by the ☿ ☿. She gradually lost the use of her legs, and in the end could only move her antennæ which she kept waving backwards and forwards. The ☿ ☿ cleaned her and carried her about, but on November 5th she was dead.

On August 11th, when I had the pleasure of Professor Wheeler's company, we found at Weybridge again, another *mixto-umbratus* ♀, as

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[11] *Ent. Rec.*, 1911, p. 236.
[12] *loc. cit.*, p. 47.
[13] *l.c.*, p. 48.

queen in a nest of *L. alienus*. These are instances in nature, where the ♀ has sought a nest of *alienus* in which to found her colony, and has been accepted by the ☿ ☿. It is probable that either the latter then killed their own queen, or the *mixto-umbratus* ♀ did so herself. I have before recorded[14] that I found some *umbratus* ☿ ☿ in a nest of *alienus* at Weybridge, on July 22nd, 1911, and suggested that a ♀ *umbratus* may have been present. From the above observations it is fairly certain that this was the case.

*Formica rufa*, L.—On March 29th Crawley and I found a very large nest, which measured 6ft. across, at St. George's Hill, Weybridge. It contained vast quantities of ♂ and ♀ larvæ and cocoons. On April 17th I found ♂ ♂ at large on fir posts, at Wellington College. It is evident that the sexes were very early this year. Bignell[15] records winged ♀ ♀ on a nest on April 22nd, 1897, near Shaughbridge. The earliest date given by Forel[16] is May 30th.

*F. rufa* var. *rufo-pratensis*, Forel.—On September 8th I found two nests of this variety at Parkhurst Forest, I. of W. They were situated on a bank, and were constructed of finer materials than the *rufa* nests in the neighbourhood, and, in fact, looked more like *exsecta* nests. The ☿ ☿ were of a yellow-red colour with a neat black spot on the pronotum, this is very distinct in some specimens, which also have a smaller black spot on the mesonotum. I have seen specimens taken by Butler at Bexhill, and by Best Gardner in Glamorgan, and Wheeler tells me he found it at Lowood, on Lake Windermere.

*F. sanguinea*, Latr.—On July 10th an attack by this species on a colony of *L. umbratus* was observed at Weybridge. The nest of the latter was situated under a gorse root some twelve paces away from the *sanguinea* nest. A row of *sanguinea* ☿ ☿ stood outside the *umbratus* nest on guard, while others had penetrated under the root, and a large number of dead *umbratus* were lying about. Many of the *sanguinea* ☿ ☿ had ☿ ☿ of the attacked species fastened to their legs and antennæ. Forel[17] describes similar forays on colonies of *L. niger* and *L. flavus* by *sanguinea*. Wheeler[18] remarks that—"Even *sanguinea* shows a tendency to lapse into the ancient instinct of plundering the nests of different species of ants indiscriminately," and records a foray by the American sub-species *rubicunda* on a variety of *Myrmica scabrinodis*.

On July 15th, when again at Weybridge, a number of *sanguinea* ☿ ☿ were observed returning to their nest with *fusca* cocoons in their jaws. A few *fusca* ☿ ☿ were noticed in the neighbourhood in flight and on the top of grass stems, some with their own cocoons in their jaws, so evidently a genuine slave-raid had taken place.

*F. exsecta*, Nyl.—A small typical nest was found near Forest Lodge at Nethy Bridge, Inverness-shire, on May 5th. This is another

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[14] *Ent. Rec.*, 1912, p. 7.
[15] *Ent. Mo. Mag.*, 1897, p. 141.
[16] *loc. cit.*, p. 408.
[17] *loc. cit.*, p. 363.
[18] *Bull. Amer. Mus. Nat. Hist.*, xxi., 1905, p. 11.

new locality in Scotland for this species. I am pleased to say there are still plenty of nests in Parkhurst Forest, Isle of Wight.

*F. fusca*, L.—On July 7th a ♀ was captured on the wing at Weybridge, and on the 18th naked ♀ pupæ were found in a nest under a stone in the same locality. Colonies of this ant were found on the Isle of Mull on April 26th, and in plenty on the Isle of Tiree. This species and *M. ruginodis*, recorded above, were the only ants I found in the latter island, although I was there from April 28th to May 2nd.

My friend Mr. Mitford gave me ☿ ☿ and deälated ♀ ♀ which he had taken at Rothes in Morayshire, one of the latter being a microgyne not much larger than a medium sized ☿.

All the races of *fusca* which have been recorded for Britain were found this year, though one will now appear under a new name.

*F. fusca* var. *glebaria*, Nyl.—First recorded for Britain by Crawley.[19] Crawley and I found a number of mound nests in the New Forest in July, ♂ ♂, one deälated ♀, and one winged ♀ being secured. I found an incipient colony in the top of a mound on July 22nd, which consisted of the deälated ♀ and some twelve ☿ ☿. According to Forel the ants from a colony we found at St. Issey, Cornwall, in April, 1911, also belong to this var.

*F. fusca* var. *rubescens*, Forel.—First recorded for Britain by the writer[20]. Colonies were found in July in the New Forest, and at Seaton in Devon, which contained many ♂ ♂, but neither winged nor deälated ♀ ♀ were obtained.

*F. fusca* var. *fusco-rufibarbis*, Forel.—First recorded for Britain by the writer[21]. Colonies were observed by Crawley at Seaton, and subsequently by myself when I was with him. I found others at Sandown and Blackgang Chine in the Isle of Wight, in September. When we have obtained more material and ♂ ♂ and ♀ ♀ of all the forms, we intend to work out and publish, if possible, more satisfactory distinctions for all these races. It is clear that in the ♂ of *rubescens* the scale is deeply cut out, more so than in any of the others, in *fusco-rufibarbis* it is widely but not deeply emarginate, and in *fusca* scarcely emarginate. I[22] have pointed out before that *fusco-rufibarbis* lives chiefly in the sand on the borders of rivers, lakes, and by the sea, and *glebaria* in the earth on the plains, *fusca* being more common in woods. This, however, is not sufficient to go by, since as we have seen *glebaria* occurred with *fusco-rufibarbis* at St. Issey, and *rubescens* with *fusco-rufibarbis* at Seaton, and *glebaria* and *rubescens* both occurred in the New Forest.

*F. fusca* sub-sp. *rufibarbis*, F.—This sub-species is very distinct, the greater number of the ☿ ☿ in a colony being partly bright red in colour, and might easily be mistaken superficially for ☿ ☿ of *sanguinea*

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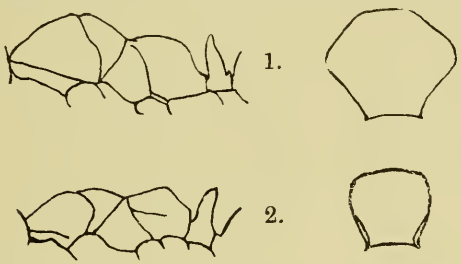
[19] *Ent. Rec.*, 1911, p. 96.
[20] *Zool.*, 1909, p. 466.
[21] *Ent. Rec.*, 1906, p. 217.
[22] *Entom.*, 1911, p. 391.

or *rufa*. They are much more active than *fusca* or any of its forms, running about in a characteristic manner, and possess a distinct aromatic smell. The ♀ ♀ also are very distinct having much red about the head and thorax. I found three colonies this year at Weybridge, one of which was situated in a bank, and the other two under the turf, by the side of paths. The nests themselves were about a foot under ground and were reached by a very small entrance hole which was very difficult to find. On July 11th I noticed a ☿ run rapidly across the path and disappear into the herbage, and after a second had been seen and secured, the nest was found with considerable difficulty. When dug up it contained three deälated ♀ ♀, a large number of ☿ ☿, larvæ and pupæ. The colony was taken home, and one of the ♀ ♀, a number of ☿ ☿ and the larvæ and pupæ were established in an observation nest. The larvæ and pupæ have since hatched and all are well to-day. The second colony was discovered on July 18th, but was not dug up till August 11th, when it was hoped the winged forms might be present. This, however, was not the case. A third colony discovered in September contained two deälated ♀ ♀. I found that the ants in my observation nest accepted ☿ ☿ from the other colonies, also pupæ, which they brought up.

*F. fusca* var. *picea*, Nyl[23].—On July 23rd, Crawley and I found a colony of this var., which was situated in a clump of sphagnum, at Matley Bog in the New Forest. It consisted of a number of ☿ ☿, and




Epinotum and scale of 1. F. gagates ☿. 2. F. picea ☿.

large cocoons which all hatched later and proved to be ♂ ♂, unfortunately no ♀ ♀ were obtained, deälated or otherwise. This is the form standing in the British list, as the sub-sp. *gagates*, Latr. Smith[24] first introduced it as British in 1866 under the name of *gagates*, on a few ☿ ☿ taken by his son at Bournemouth. Farren[25] White rediscovered it at Bournemouth in 1872 and rightly stating it was distinct from *gagates*, he proposed the name of *glabra* for it. Saunders,[26] however, stated that he did not agree with White that it was distinct from *gagates*, and retained the latter name in his book[27]. In July, 1905 Arnold[28] found a colony in the New Forest, which is recorded as

[23] *Acta. soc. sc. Fennicae*, II., 3, 1846, p. 917.
[24] *Ent. Ann.*, 1886, p. 127.
[25] *Ants and Their Ways*, 1895, p. 234.
[26] *Ent. Mo. Mag.*, xx., 1885, p. 16.
[27] *Hym. Aculeata*, 1896, p. 22.
[28] *Ent. Mo. Mag.*, 1905, p. 211.

*gagates*. I detected a specimen in the Dale collection at Oxford, from Wareham, in Dorset. The ♀ of *picea* differs from that of *gagates* in the shape of the epinotum and scale. The epinotum of the former when seen in profile, is although slightly rounded, yet distinctly angled, whereas in the latter it is quite rounded. The scales are also very distinct, as will be seen by the accompanying sketches.

Emery[29] remarks that he does not possess a ♀ or ♂ of *picea* and from the descriptions there is nothing definite given to separate them from *gagates*. I possess a ♀ *picea* from Belgium kindly given to me by Bondroit and a ♀ *gagates* from Vienna, kindly given to me by Forel, and the scales are very different, much as in the ☿ ☿. In *gagates* it is excavated at the top and shaped like that of the ☿, in *picea* it is rounded. Unfortunately, I do not possess a ♂ of *gagates*. Emery[30] says the scale is not, or scarcely, cut out above. In *picea* ♂ it is evidently, but not widely nor deeply, emarginate. From *fusca* and the other forms, *picea* may be known by its more glabrous and shining body.

(*To be concluded.*)

## In Sunny Spain.—July and August, 1912. (*With plate.*)

By ROSA E. PAGE, B.A.

(*Concluded from page 36.*)

The only house between Cuenca and Uña was reached about noon. Here we were most kindly welcomed, a table and other necessaries being provided for our lunch, which we had brought with us. Nothing but water is to be obtained at this half-way house and not a vestige of anything to eat is to be found *en route*, so that it is absolutely essential to carry with one the day's provisions. The charge for shelter and attendance was 25 centimes; this included the stabling and feeding of the two donkeys. Very few insects were about, and these were very worn. Among them were *Melanargia lachesis*, *Colias edusa*, *Pontia daplidice*, *Agriades coridon* var. *arragonensis*, Gerh., and *Satyrus statilinus*, which was the only species in good order. Just before reaching Uña, however, we saw a few *Erebia zapateri* in a gorge. These were quite freshly emerged, and came as a great surprise, as we did not expect to see the species until we reached Bronchales.

We found Uña a dirty little village, most picturesquely placed, however, beside a small lake of the same name, which empties itself into the river Jucar by a fine waterfall, and is justly celebrated for its trout. We rested the night at the house of Señor Felix Gomez. Our host came in at dusk from the threshing field, received us most hospitably and saw to our comfort, and not until we were well through with our meal did he sit down to his own supper in a corner of the same room surrounded by his family, each dipping a spoon in turn into the pan which was placed in the centre. We had arranged to leave Uña at 5 o'clock the next morning, but no one in this land of "mañana" has the slightest idea of being hurried, so that it was fully three hours later before we could get away. We started as before, riding on the animal that had no baggage, but we had not proceeded far before we

[29] *Deutschr. Ent. Zeitschr.*, 1909, p. 195.
[30] *loc. cit.*, p. 194.